

TECHNICAL AUDIT –A A A

ASSESS, ANALYSE, ADVISE !

TECHNICAL AUDIT IN FOUNDRIES – a Preamble:

The foundry industry is changing over the years lot of technological upgradation is being carried out to control the rejects at primary and secondary stage. Many foundries have upgraded to High Pressure Molding lines from low/medium pressure molding processes, to control mold dilation and related problems. Many have adopted automation in pouring, mold movements, knock-out and fettling operations. They have introduced ISO systems (TS as well) to bring in the discipline in operations but story has not changed over the years.

Perhaps because Foundry operations are considered more an art than science. Even today the belief has not changed. Many have started understanding that there is a technology gap and we must bridge this gap, to control the rejects. What is technology? It is nothing but science plus engineering. The Europeans, do not believe in human skills and depend a lot on automation, where process parameters are likely to change. Many of us are adopting to this change but alas, blindly!

There are innumerable variables in foundry - a fact universally accepted. In today's world consistency is the key word and to bring in consistency in quality of castings, one has to control the variables and make the process more stable. Today it is possible to measure and control most of the parameters. As per ISO system, we identify the process variables and try to control these within prescribed limits. This is being done, over last 15 years to satisfy ISO/TS authorities but the outcome is not satisfactory because if we follow the wrong control limits, results are likely to go wrong.

That is why the whole system needs to be checked “technically” by means of “Audit”.

The “Technical Audit” will identify flaws in the system by close examination of various processes.

Ultimately desired results can be obtained only when the process is made stable and sturdy. Therefore a periodical Technical Audit apart from ISO Audit is the need of the hour for those who desire to enhance the technical performance.

HOW DOES IT DIFFER FROM QUALITY AUDIT (QA)

- Primary focus of QA is on quality related aspects while Technical Audit (TA) encompasses all aspects of foundry operations like production; productivity; selected processes and their capability; manpower and plant uptime.
- QA merely brings out comparison between accepted targets and actual achievements. TA on the other hand brings out why targets have not been achieved.
- QA is more of a mechanical and superficial process while TA will be deeper and more interactive.
- After conclusion of TA a comprehensive action plan can be drawn first to identify lacunae in equipment, process selection and control and then to recommend corrective measures to overcome identified roadblocks.
- TA is carried out by a Technocrat with proven track record and vast hands-on experience to Assess, Analyse and Advise appropriate remedial measures. This avenue may not be available in a QA because firstly a QA Auditor is primarily focussed on quality aspects and secondly may not possess domain knowledge of foundry operations.

WHO CONDUCTS TECHNICAL AUDIT

NCTS has more than 25 eminent foundry technologists spread all over India on its Panel of Experts who have a hands on experience in their chosen field like Ferrous foundries (Grey Iron, S G Iron, C G Iron and Steel) and Non Ferrous Foundries (Aluminium, Copper and Magnesium); Heat treatment furnaces; Foundry Instrumentation and foundry materials.

When a request for Technical Audit is received from a client, an Expert who has relevant background will be deputed by NCTS to the foundry. TA will be carried out over two working days during which all aspects of foundry operations (briefly listed above) will be studied and assessed.

The assessment and findings will be further deliberated by the core group of Experts at NCTS,Pune and a report on remedial measures will be prepared.

THIS IS THE AAA – ASSESS, ANALYSE AND ADVISE !

HOW WILL TA BE CARRIED OUT

In depth study will be made of all foundry Operations on following lines:

S.NO	DESCRIPTION	EXISTING	RECOMMENDED
a	Mold Shop and Sand Plant		
i	Installed capacity		
ii	Capacity Utilisation		
iii	Capability assessment of various Molding and sand plant equipment		
iv	Molding process suitability		
v	Quality of new sand and additives		
vi	Mulling equipment – output, efficiency		
vii	Prepared sand quality parameters		
viii	Return sand properties		
ix	Sand conveying system		
b	Melt Shop and Pouring		
i	Melting Equipment – Installed Capacity and actual utilisation		
ii	Energy Consumption		
iii	Liquid Metal Holding and Dispensing Time		
iv	Raw material quality		
v	Raw material consumption		
vi	Melting loss		
vii	Inoculation – materials and methods		
c	Core Shop and Core Assembly		
i	Core Making Process		
ii	Equipment		
iii	Materials used and quality		
iv	Consumption of materials		
v	Core Wash – material and method		
vi	Core wash drying		
vii	Core assembly and placement		
d	Fettling and Finishing		
i	Fettling Process		
ii	Shot Blasting		
iii	Degating; Grinding		
iv	Layout of Shop		
v	Proof Machining		
VI	Averaging		
e	Quality Assurance		
i	METAL CONTROL		
	Chemical Analysis Equipment, Spectrometer,		

	Micrography Equipment		
	Equipment for physical tests like hardness, Strength,		
	Temp. Measuring System		
	Thermal Analysis		
ii	SAND CONTROL		
	Equipment for properties like GCS, Shear, Compactability, Moisture, Permeability and others		
iii	N D T		
	X Ray		
	Crack Detection, Ultrasonic		
	Hydraulic Testing		
iv	REJECTION CONTROL		
	Data keeping		
	Traceability		
	Defect Analysis and Corrective Actions		
f	Maintenance		
	Philosophy – prevent or repair;		
	O E E study		
	Spare parts Consumption		
	Calibration of equipment		
g	Manpower (Workers and staff)		
i	Department wise deployment		
ii	Productivity – norms vs actual		
iii	Training Needs		
h	Patterns and Coreboxes		
i	Design and Construction		
ii	Maintenance		
j	Methoding		
i	Principles of Gating		
ii	Defects related to gating design		

COST OF THE AAA EXERCISE

Charges will depend upon the size of the foundry operations. Typically for an Iron Foundry (500 TPM) or Steel Foundry (200 TPM) or Aluminium Foundry (50 TPM) the charges will be **Rs 35000 plus tax** for generating and submitting a comprehensive report. In addition the customer to bear **full cost of Travel – Lodging – Boarding –Sundry expenses at actuals of one expert for maximum of three days**. Report will be submitted within three weeks of Assessment visit by the Expert. NCTS will assume full responsibility for the report and may offer problem solving field solutions under their C / E / T initiative if requested.

For Foundry operations larger than mentioned above, charges commensurate to work involved will be separately worked out.

aa / 220514 / 040614

050614.